

Original Article**Molecular Detection of *Leishmania major* and *L. turanica* in *Phlebotomus papatasi* and First Natural Infection of *P. salehi* to *L. major* in North-East of Iran**

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Abstract

Background: Leishmaniasis is an important public health disease in many developing countries as well in Iran. The main objective of this study was to investigate on *leishmania* infection of wild caught sand flies in an endemic focus of disease in Esfarayen district, north east of Iran.

Methods: Sand flies were collected by sticky papers and mounted in a drop of Puri's medium for species identification. Polymerase chain reaction techniques of kDNA, ITS1-rDNA, followed by restriction fragment length polymorphism were used for identification of DNA of *Leishmania* parasites within infected sand flies.

Results: Among the collected female sand flies, two species of *Phlebotomus papatasi* and *Phlebotomus salehi* were found naturally infected with *Leishmania major*. Furthermore, mixed infection of *Leishmania turanica* and *L. major* was observed in one specimen of *P. papatasi*. Sequence analysis revealed two parasite ITS1 haplotypes including three *L. major* with accession numbers: KJ425408, KJ425407, KM056403 and one *L. turanica*. (KJ425406). The haplotype of *L. major* was identical (100%) to several *L. major* sequences deposited in GenBank, including isolates from Iran, (Gen Bank accession nos. AY573187, KC505421, KJ194178) and Uzbekistan (Accession no. FN677357).

Conclusion: To our knowledge, this is the first detection of *L. major* within wild caught *P. salehi* in north-east of Iran.

Keywords: *Leishmania major*, *L. turanica*, *P. salehi*, *Phlebotomus papatasi*, Iran

Introduction

Leishmaniasis is an important public health disease in the world. The disease is endemic in more than 98 countries including Iran (WHO 2010). Cutaneous leishmaniasis (CL) is a worldwide public health and a social problem in many developing countries. Old world cutaneous leishmaniasis is present in many endemic areas of North Africa, the Mediterranean, the Middle East, the Indian

subcontinent and Central Asia. The species responsible for old world cutaneous leishmaniasis are mainly *L. major* and *L. tropica*, *L. infantum* and *L. donovani* can also cause localized CL but, are observed less frequently in the Mediterranean areas. Diffuse CL is uncommon and is caused by *L. aethiopica* in Africa (Goto et al. 2010, Hotez et al. 2012).

The incidence rate of the disease is 0.7 to